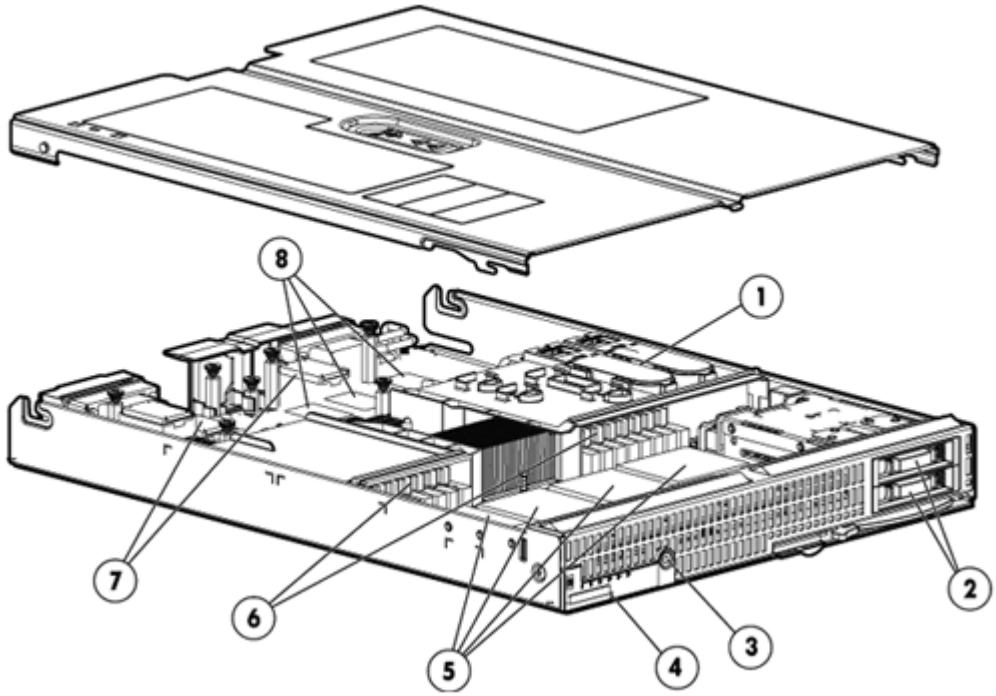
Overview



HP ProLiant BL680c Generation 5 (G5) Server Blade

Front view image

1. Cache battery modules
2. Two small form factor (SFF) hot-plug drive bays
3. Power button
4. Local I/O connector
5. Up to four Intel® Quad-core Xeon® 7300 processors
6. Up to 128 GB PC2-5300, DDR2 FB DIMMs
7. Three I/O expansion mezzanine slots
8. Four embedded Gigabit Ethernet adapter ports

What's New

- Support for the 8 GB Low Power Memory option kit

At A Glance

This document covers the HP ProLiant BL680c G5 server blade only. For more information on the HP BladeSystem c-Class Infrastructure and HP BladeSystem c-Class Interconnects, please see the following QuickSpecs:
HP BladeSystem c-Class Infrastructure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.html
HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_na/12524_na.html

- The HP ProLiant BL680c G5 delivers no-compromise performance and expansion in the densest 4P server blade form-factor available to handle your most demanding applications. The HP ProLiant BL680c server blade G5 includes:
- Processor:
  - Up to four Quad-Core Intel® Xeon® 7300 Series processors

Overview

- Intel 7300 chipset supporting a 1066 MT/s Dedicated High-Speed Interconnect (DHSI)
- Demand Based Switching (DBS) with Enhanced Intel SpeedStep® Technology on select models
- Up to 8 MB (2x4 MB) L2 cache
- Intel® Virtualization Technology

- Memory:
  - Up to 128 GB of memory supported by sixteen (16) PC2-5300, fully-buffered DIMMs at 667 MHz
  - Advanced ECC memory support
  - Memory interleaving (2 x 1), memory mirroring, and online spare capacity
- Storage Controller:
  - Integrated HP Smart Array P400i Controller with 256 MB cache, RAID 0/1, and optional battery-backed write cache upgrades
- Internal Drive Support:
  - Up to two (2) small form factor (SFF) SAS or SATA hot-plug hard drives
- Network Controller:
  - Four (4) embedded network adapter ports, plus one (1) additional management network adapter port:
    - One (1) embedded NC326i Dual Port Gigabit Server Adapter
    - Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine for Microsoft Windows
    - One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
- Mezzanine Support:
  - Three (3) mezzanine expansion slots for additional I/O mezzanine including:
    - Dual Port 4Gb Fibre Channel for SAN connectivity (choice of Emulex or QLogic)
    - Dual port 10 Gb Ethernet for high bandwidth network connectivity
    - Multiple dual and quad port Gigabit Ethernet network adapter options for increased bandwidth and additional network ports
    - Dual port 20Gb 4X DDR InfiniBand for low latency server interconnectivity
- Internal USB Support:
  - One (1) internal USB 2.0 connector for security key devices and USB drive keys
- Form Factor:
  - The HP ProLiant BL680c G5 server blade plugs vertically into the HP BladeSystem c3000 and c7000 enclosures
- Management:
  - Integrated Lights-Out 2 Standard Blade Edition with virtual KVM graphical remote console
- Enclosures:
  - HP offers three different c-Class server blade enclosures to meet your individual needs:
    - The HP BladeSystem c7000 rack enclosure is 10U high and holds up to 8 HP ProLiant BL480c servers plugged vertically.
    - The HP BladeSystem c3000 rack enclosure is 6U high and holds up to 4 HP ProLiant BL480c servers plugged horizontally.
    - The HP BladeSystem c3000 tower enclosure is designed with casters for sites without racks and holds up to 4 HP ProLiant BL480c servers plugged vertically.
  - Server blades, storage blades, and interconnect modules are all designed to fit into the c7000 and c3000 enclosures.
  - For additional enclosure information, please see: http://h18004.www1.hp.com/products/blades/components/enclosures/c-class/index.html.
- Warranty:
  - Protected by HP Services and a worldwide network of HP Authorized Channel Partners. Three-year parts, 3 Year Labor and 3 Year on-site limited global warranty. Certain restrictions and exclusions apply. SATA hard drives have a one year warranty.

Standard Features

Processor	Quad-Core Intel® Xeon® Processor E7340 (2.40 GHz, 2x4 MB L2 Cache, 10666 MT/s DHSI, 80W, DBS) Quad-Core Intel® Xeon® Processor E7330 (2.40 GHz, 2x3 MB L2 Cache, 1066 MT/s DHSI, 80W, DBS) Quad-Core Intel® Xeon® Processor E7320 (2.13 GHz, 2x2 MB L2 Cache, 1066 MT/s DHSI, 80W, DBS) Quad-Core Intel® Xeon ®Processor E7310 (1.60 GHz, 2x2 MB L2 Cache, 1066 MT/s DHSI, 80W) Quad-Core Intel® Xeon® Processor L7345 (1.86 GHz, 2x4 MB L2 Cache, 1066 MT/s DHSI, 50W Low Voltage)* Dual-Core Intel® Xeon® Processor E7220 (2.93 GHz, 2x4 MB L2 Cache, 1066 MT/s DHSI, 80W, DBS)* NOTE: For the Intel 7300 series, the letter preceding the model number indicates the performance/wattage of the processor. The "E" denotes enterprise performance/wattage (mainstream); and "L" denotes lower wattage. * Offered through Configure-To-Order only. See Factory Integrated Models section for more details.
Upgradeability	Upgradeable to four processors
Cache Memory	Up to 8 MB (2x4 MB) level 2 cache memory depending on model
Chipset	Intel® 7300 chipset
Memory	Type: PC2-5300 Fully Buffered DIMMs operating at 667 MHz Standard: 2 GB (2 x 1 GB) 4 GB (4 x 1 GB) Maximum: 128 GB (16 x 8 GB) NOTE: See the "DIMM installation guidelines" section for memory installation rules.
Network Controller	Four (4) embedded Gigabit Ethernet network adapter ports, plus (1) additional management network adapter port: • One (1) embedded NC326i Dual Port Gigabit Server Adapter • Two (2) embedded NC373i Multifunction Gigabit Server Adapters with TCP/IP Offload Engine for Microsoft Windows • One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management

Standard Features

Multifunction Networking	The embedded multifunction NC373i combines standard Gigabit Ethernet networking, TCP/IP offload engine (TOE) acceleration, and iSCSI boot capability into a single adapter. • TOE moves the processing of data in the TCP protocol stack from the server CPU to the network card, freeing CPU cycles for other activities. With TOE, network communications are improved, and server efficiency is increased. The NC373i offers TOE for Microsoft® Windows environments. • iSCSI boot allows the BL680c G5 to boot from a remote operating system (OS) image located on a storage area network (SAN). The BL680c G5 uses an iSCSI firmware image (iSCSI boot option ROM) making the remote disk drive appear as a local, bootable C: drive. The BL680c G5 is configured to connect to and boot from the iSCSI target disk on the network and download the OS image from the iSCSI target disk. The iSCSI boot option ROM is supplied by HP at no cost. The additional cost and mezzanine slot usage of an add-in iSCSI HBA card is not required. Additionally, the HP iSCSI boot solution includes scripts to significantly simplify the installation process.		
I/O Expansion Slots	Three I/O expansion mezzanine slots (two PCI Express x8 and one x4)		
Integrated Manageability	Integrated Lights-Out 2 Standard Blade Edition (iLO 2)		
Storage Controller	HP Smart Array P400i Controller	256 MB memory module supports RAID 0/1 Available upgrades Battery-backed write cache, or 512 MB cache with battery-backed write cache	
Maximum Internal Storage	Hot Plug Serial Attach SCSI (SAS)	292 GB SAS	2 x 146 GB Serial SCSI
Graphics	Integrated ATI RN-50 1280 x 1024 x 16M color (32 MB DDR1 memory)		
Graphics Resolution	Resolution Color Depths	1280 x 1024, 16.7M , 64k, 256,16 1024 x 768, 16.7M, 64k, 256, 16 800 x 600, 16.7M, 64k, 256, 16 640 x 480, 16.7M, 64k, 256, 16	
Fibre Channel	Two optional 4 Gb Fibre Channel HBA mezzanines are supported ordered separately: • Emulex LPe1105-HP 4Gb FC HBA for HP c-Class BladeSystem (403621-B21) • QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (403619-B21) NOTE: For additional information on the optional 4 Gb Fibre Channel HBA mezzanines, see: http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html		

Standard Features

Compatible SAN	HP ProLiant BL680c G5 server blades are optimized for HP StorageWorks MSA, EVA, and XP HP ProLiant BL680c G5 server blades are compatible with select third party SANs (please see blade storage page for more details: http://h18000.www1.hp.com/products/servers/proliant-bl/c-Class/storage.html)

Insight Control Management Suites

Insight Control Environment for BladeSystem delivers foundation management for HP BladeSystem lifecycles, including hardware resource deployment, health monitoring, software version control, performance monitoring, vulnerability, scanning and patch management.

Installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager
- HP iLO Select Pack
- HP Insight Power Manager
- HP ProLiant Essentials Rapid Deployment Pack
- HP ProLiant Essentials Performance Management Pack
- HP ProLiant Essentials Vulnerability and Patch Management Pack
- HP ProLiant Essentials Virtual Machine Management Pack

Additional ProLiant Essentials software and management tools included on the Insight Control Management kit can be installed manually.

- Server Migration Pack - Universal Pack
- HP Open Service Event Manager
- HP Instant Support Enterprise Edition

NOTE: Server Migration Pack - Universal Edition can be installed from the SMP-P2P CD included in the Insight Control Management media kit.

NOTE: Insight Control Environment for BladeSystems can be installed from the Insight Control Management DVD, which can be delivered with HP BladeSystem c-Class enclosures with a choice of licensing options. Licensing options include a free 30 day evaluation license for 8 servers (default option for every enclosure order), a full purchased license for 8 blade servers or a full purchased license for 16 blade servers). For additional information on HP c-Class Infrastructure please visit: HP BladeSystem c-Class Infrastructure QuickSpecs: http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.html

NOTE: For additional product and licensing information about Insight Control Environment for BladeSystem, HP Systems Insight Manager and Essentials software refer to http://www.hp.com/servers/proliantessentials.

HP Insight Control management suites and most HP ProLiant Essentials include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Server Management Standalone Software Product - ProLiant Essentials

HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) extends HP Systems Insight Manager with a complete deployment solution for HP ProLiant blade servers. RDP provides a central location to configure server hardware, deploy Windows, Linux and VMware ESX operating environments and install HP ProLiant Support Pack drivers using images and scripted profiles.

Standard Features

ProLiant Essentials Server Migration Pack - Universal Edition	Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP Universal allows all of the following migrations: • physical to ProLiant • physical to virtual • virtual to virtual • virtual to ProLiant NOTE: For more information, visit: http://www.hp.com/go/migrate.
ProLiant Essentials Performance Management Pack	Performance Management Pack (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
Integrated Lights-Out Select Pack	Upgrades the iLO 2 processor with enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting, power capping and enterprise security (directory services and two-factor authentication) for servers managed using remote consoles available in iLO 2 Standard and iLO 2 Standard Blade Edition.
iLO Power Management Pack	Is energy-efficient management software that delivers centralized control, reliable security, and energy savings for your BladeSystem infrastructure. iPMP combines the total control of iLO 2 Advanced in the area of remote management with the energy monitoring and control of the Insight Power Manager to deliver a robust solution capable of full remote control and power management of ProLiant servers through a unified interface within HP Systems Insight Manager.
Insight Power Manager (IPM)	Upgrades the single-server remote management capabilities of iLO Select/Advanced to include centralized reporting and policy-based management of power consumption and thermal output provided by the Insight Power Manager. IPM unifies all of this functionality within a single user interface - HP Systems Insight Manager.
Virtual Machine Management Pack	Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager. The Virtual Machine Management Pack plug-in provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association. The Server Migration Pack plug-in automates the manual task of migrating servers between physical or virtual platforms. NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to: http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information. NOTE: Selected software packages listed here include one year of 24 x 7 Software Technical Support and Update Service. If you have any questions about this service please visit the HP website at: http://www.hp.com/services/insight.

Standard Features

	Vulnerability and Patch Management Pack	Vulnerability and Patch Management Pack (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses, worms, and other blended threats.
Core Infrastructure Management	SmartStart	SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart 7.60 and later can now deploy the HP ProLiant BL680c G5 using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server order or download your copy from the SmartStart web site. For more information, please visit the SmartStart website at: http://www.hp.com/servers/smartstart. SmartStart version supported (minimum): SmartStart 7.60
	Insight Management Agents	The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers. Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack. For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ProLiant Support Packs and ROMPaq, software	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the ProLiant Essentials Rapid Deployment Pack, SmartStart or downloaded from software and drivers download pages website at: http://www.hp.com/go/support.

Standard Features

OS Support

Microsoft Windows Server 2003, Standard Edition (32 and 64-bit)
Microsoft Windows Server 2003, Enterprise Edition (32 and 64-bit)
Microsoft Windows Server 2003, Compute Cluster Server
Microsoft Windows Server 2003, Datacenter (Non-High Availability)
Microsoft Windows Server 2008
Red Hat Enterprise Linux
SUSE Linux Enterprise Server
VMware ESX 3.0 Server

NOTE: For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos.
NOTE: For an up-to-date listing of the latest software and drivers available for your server, please select your server: http://h20000.www2.hp.com/bizsupport/TechSupport/Product.jsp?lang=en&cc=us&taskId=135&prodTypeId=15351&prodCatId=241435.

Integrated Manageability

Integrated Lights-Out 2 (iLO 2) Standard Blade Edition (integrated on motherboard)

- Virtual KVM based remote console
- Virtual media (single server, browser based access only)
- Remote serial console
- Virtual power button control
- Virtual Unit ID control
- Integrated remote console (ActiveX Control client)
- Dedicated network connectivity
- OS independent hardware health status present server power consumption
- Browser, command line and scripted access
- Automatic IP configuration via DHCP/DNS/WINS
- Industry standard 128-bit secure sockets layer (SSL) and secure shell security (SSH)
- Advanced encryption standard (AES)/triple data encryption standard (3DES)
- IML and iLO event logging
- Support for 12 user accounts with customizable access privilege
- Single sign-on from HP BladeSystem Onboard Administrator

Availability

- Dual-Port Fibre Channel Mezzanine Card for redundant SAN connection
- Four (4) embedded Gigabit Ethernet adapters for redundant LAN connections
- Multiple mezzanine I/O expansion
- Four (4) hot-plug SAS/SATA hard drive bays and integrated RAID (HP Smart Array P400i) controller on every server blade (battery-backed write cache is optional)
- Redundant ROM
- Advanced ECC Memory - can correct a multi-bit error (up to 4 bits) that occurs within one memory chip
- Memory mirroring with memory online spare capacity
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

Standard Features

Industry Standard Compliance	ACPI 2.0 Compliant PCI 2.2 Compliant WOL Support Microsoft® Logo certifications USB 2.0 Support

Security	• One (1) internal USB 2.0 connector for security key devices and USB drive keys • Power-on password • Administrator's password • Integrated Lights-Out 2 has 12 customizable user accounts and SSL encryption • Integrated Lights-Out 2 can be disabled via a global setting

Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSA1000, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services on your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Enterprise Configurator	The HP eCo-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Service and Support	This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. NOTE: Server warranty includes 3 year Parts, 3 year Labor, 3-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html HP Care Pack services provide total care and support expertise with committed response designed to meet your IT and business needs. The HP Care Pack service for HP ProLiant BL c-Class server blades cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.

Standard Features

To fully capitalize on your HP BladeSystem servers' capabilities, a service partner is required who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation, HP has a BladeSystem server support offer to help you speedily deploy and maximize system uptime.

NOTE: SAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 and c3000 enclosure Care Packs, SAN/Fabric switches carry separate Care Packs. SAN/Fabric Switch Care Pack service level support should always be uplifted to match existing storage or server service level.

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a BladeSystem server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - Simplify ProLiant solution implementation, maintenance and management.

- Support Service - 4-Hour Response Coverage, 3-Year, 24 x 7, Same Business Day
- Deployment Service - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - Optimize service level to increase IT performance and availability

- Support Service - HP Proactive BladeSystem Service, 1-Year
- Deployment Service - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/bladesystemservices
http://www.hp.com/go/proliant/carepack

Models

Quad-Core Models

HP ProLiant BL680c G5 2.4/2x4M,80W (2P) 443528-B21	Processor(s) One of the following depending on model	(2) Quad-Core Intel® Xeon® Processor E7340 (2.40 GHz, 2x4 MB, 80W) (2) Quad-Core Intel® Xeon® Processor E7330 (2.40 GHz, 2x3 MB, 80W) (2) Quad-Core Intel® Xeon® Processor E7320 (2.13 GHz, 2x2 MB, 80W) (2) Quad-Core Intel® Xeon® Processor E7310 (1.60 GHz, 2x2 MB 80W)
HP ProLiant BL680c G5 2.4/2x3M, 80W (2P) 449316-B21	Cache Memory One of the following depending on model	2x4 MB Level 2 cache memory 2x3 MB Level 2 cache Memory 2x2 MB Level 2 Cache Memory
HP ProLiant BL680c G5 2.13/2x2M,80W (2P) 443529-B21	Memory	8 GB (4x2 GB) PC2-5300, FBD DDR2-667
	Network Controller	Four (4) embedded Gigabit Ethernet network adapter ports, plus one (1) additional management network adapter port: • Two (2) embedded NC373i Multifunction Gigabit Server Adapters • One (1) NC326i Dual Port Gigabit Server Adapter • One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management
HP ProLiant BL680c G5 1.6/2x2M,80W (2P) 443530-B21	Storage Controller	Integrated HP Smart Array P400i Controller with 256 MB cache, RAID 0/1, and optional battery-backed write cache upgrades
	Hard Drives	No drives included; two (2) SFF SAS/SATA drive bays
	Internal Storage	292 GB SAS 240 GB SATA
	Optical Drive	None
	Form Factor	Up to 4 full-height blades supported in the HP BladeSystem c3000 enclosure Up to 8 full-height blades supported in the HP BladeSystem c7000 enclosure

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order servers must start with a CTO Blade.
NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.
NOTE: FIO indicates that this option is a Factory Installable Option.

Step 1: Base Server Blade Configuration (Select a configurable Blade)

Models	HP ProLiant BL680c G5 CTO Blade	443527-B21
	Configurable Model ships with:	
	Four (4) embedded Gigabit Ethernet network adapter ports, plus one (1) additional management network adapter port: • Two (2) embedded NC373i Multifunction Gigabit Server Adapters • One (1) NC326i Dual Port Gigabit Server Adapter • One (1) additional embedded 10/100 network adapter dedicated to iLO 2 management	
	Integrated HP Smart Array P400i Controller with 256 MB cache and RAID 0/1 NOTE: Controller cache module selection is required. Select either the standard 256 MB module or the 512 MB module with BBWC upgrade in step 2 below.	
	Two (2) small form factor (SFF) SAS/SATA hot-plug hard drive bays	
	Integrated Lights-Out 2 Standard Blade Edition	

Step 2: Choose Required Options (one of the following from each list unless otherwise noted):

Processors	Quad-Core Intel® Xeon® Processor E7340 (2.40 GHz, 2x4 MB, 80W, 2P kit) NOTE: If 4 processors are desired, select one 443691-L21 and one 443691-B21	443691-L21
	Quad-Core Intel® Xeon® Processor E7330 (2.40 GHz, 2x3 MB, 80W, 2P kit) NOTE: If 4 processors are desired, select one 449321-L21 and one 449321-B21	449321-L21
	Quad-Core Intel® Xeon® Processor E7320 (2.13 GHz, 2x2 MB, 80W, 2P kit) NOTE: If 4 processors are desired, select one 443692-L21 and one 443692-B21	443692-L21
	Quad-Core Intel® Xeon® Processor E7310 (1.86 GHz, 2x2 MB, 80W, 2P kit) NOTE: If 4 processors are desired, select one 443693-L21 and one 443693-B21	443693-L21
	Quad-Core Intel® Xeon ®Processor L7345 (1.86 GHz, 2x4 MB, 50W, 2P kit) NOTE: If 4 processors are desired, select one 450963-L21 and one 450963-B21	450963-L21
	Dual-Core Intel® Xeon® Processor E7220 (2.93 GHz, 2x4 MB, 80W, 2P kit) NOTE: If 4 processors are desired, select one 450961-L21 and one 450961-B21	450961-L21
Memory	2 GB FBD PC2-5300 2 x 1 GB Kit	397411-B21
	4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21
	8 GB FBD PC2-5300 2 x 4 GB Kit	397415-B21
	8 GB FBD PC2-5300 2 x 4 GB LP Kit, Low Power	466440-B21
	16 GB FBD PC2-5300 2 x 8 GB Kit	413015-B21
	HP 2 GB FBD PC2-5300 2 x 1 GB Low Power Kit	461826-B21
	HP 4 GB FBD PC2-5300 2 x 2 GB Low Power Kit	461828-B21

	NOTE: Memory Option Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/ NOTE: Two-way memory interleaving is enabled when an identical pair of DIMMs is installed.	
Smart Array P400i upgrade options	HP Smart Array P400i 256 MB cache	405139-B21
	HP Smart Array P400i 512 MB and battery-backed write cache upgrade	405148-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, including server blade enclosures, interconnect options and power subsystem options; please see the following QuickSpecs:
HP BladeSystem c-Class Infrastructure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.html
HP BladeSystem c-Class Interconnect Components QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_na/12524_na.html

Options

Ethernet Mezzanine Options	HP NC325m PCI Express Quad Port 1Gb Server Adapter for c-Class BladeSystem	416585-B21
	HP NC326m PCI Express Dual Port 1Gb Server Adapter for c-Class BladeSystem	406771-B21
	HP NC360m Dual Port 1GbE BL-c Adapter	445978-B21
	HP NC364m Quad Port 1GbE BL-c Adapter	447883-B21
	HP NC373m PCI Express Dual Port Multifunction Gigabit Server Adapter for c-Class BladeSystem	406770-B21
	HP NC512m Dual Port 10GbE Multifunction BL-c Adapter NOTE: An NC512m network adapter card is required for each server blade connecting to the HP 10Gb Ethernet BL-c Switch. NOTE: A maximum of one NC512m is supported per server in a type II mezzanine slot. NOTE: The NC512m requires a minimum of 4 GB of server memory and supports a maximum of 32 GB. Therefore, when an NC512m is installed in a blade server, the server is limited to a maximum of 32 GB of memory.	440910-B21
Fibre Channel Mezzanine Options	Emulex LPe1105 FC Dual Channel 4Gb, PCI-E-to-Fibre Channel Host Bus Adapter	403621-B21
	QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem	403619-B21
HP InfiniBand Mezzanine Options	HP 4X DDR IB DUAL PORT Mezzanine HCA for HP BladeSystem c-Class	448262-B21
	HP 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	410533-B21
	HP HPCD 4X DDR IB Mezzanine HCA for HP BladeSystem c-Class	409377-B21
c-Class Mezzanines	HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class NOTE: Required to support the HP StorageWorks SB40c Storage Blade (P/N 411243-B21) with HP c-Class BladeSystem full-height server blades.	431643-B21
HP StorageWorks SB40c Storage Blade	HP StorageWorks SB40c Storage Blade NOTE: Please see the SB40c Storage Blade QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/12587_na/12587_na.html NOTE: The HP PCI Express Mezzanine Pass-Thru Card for HP BladeSystem c-Class (P/N 431643-B21) is required to support the HP StorageWorks SB40c Storage Blade with HP c-Class BladeSystem full-height server blades.	411243-B21
HP PCI Expansion Blade	HP PCI Expansion Blade NOTE: Ships with one pre-installed PCI-X connect board. Also includes one PCIe connect board which requires installation. NOTE: Please see the HP PCI Expansion Blade QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/12753_na/12753_na.html	448018-B21

Options

HP c-Class Tape Blades	HP StorageWorks Ultrium 448c Tape Blade	440947-B21
	HP StorageWorks SB920c Tape Blade	AJ401A
	NOTE: Please see the HP Tape Blades QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/12729_na/12729_na.html NOTE: Please visit the BladeSystem c-Class enclosure QuickSpecs for a complete list of recommended data protection solutions for BladeSystem c-Class enclosures http://www.hp.com/go/blades.	
HP Insight Control Management Suites	NOTE: Electronic licensing options are available for Insight Control suites software products. Please see the appropriate Insight Control QuickSpecs for additional information.	
	Insight Control Environment for BladeSystem	
	HP Insight Control Environment for BladeSystem, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	453484-B21
	HP Insight Control Management Software Media Kit NOTE: Insight Control Management DVD media without licenses. Contains Insight Manager and Essentials software products and components licensed by Insight Control Management suites. Uses an integrated installer to perform quick and accurate software installation and updates.	436222-B21
	NOTE: For additional HP Insight Control Environment, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html	
	HP iLO Power Management Pack for HP BladeSystem	
	HP iLO Power Management Pack for BladeSystem, No Media, 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: This option kit includes 1 license for iLO Select and Insight Power Manager. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	442937-B21
	NOTE: For additional HP Insight Power Manager Packs, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12632_na/12632_na.html	
Server Management Stand Alone Software Product – ProLiant Essentials	NOTE: Electronic licensing options are available for Insight Control suites and select ProLiant Essentials software products. Please see the appropriate Insight Control and ProLiant Essentials QuickSpecs for additional information.	
	Deploy	
	ProLiant Essentials Rapid Deployment Pack	
	ProLiant Essentials Rapid Deployment Pack No Media 1-Server License including 1 year of 24x7 Technical Support and Updates NOTE: This license allows 1 server to be deployed and managed via RDP. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the	452151-B21

license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

NOTE: For additional ProLiant Essentials Rapid Deployment Pack License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/11053_na/11053_na.html

Server Migration Pack – Universal Edition

HP Server Migration Pack – Universal Edition, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support — 460750-B21
NOTE: This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

HP Server Migration Pack – Universal Edition, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support — 460753-B21
NOTE: This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

HP Server Migration Pack – Universal Edition, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support and Updates NOTE: This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. — 460756-B21

NOTE: For additional Server Migration Pack - Universal Edition License Kits please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12855_na/12855_na.html

Control

Integrated Lights-Out Select Pack — 452158-B21

ProLiant Essentials Integrated Lights-Out Advanced Pack, No Media, 1-Server License

Featuring: Sophisticated remote control and security features for HP BladeSystem servers and ProLiant ML/DL servers.
NOTE: For additional ProLiant Essentials Integrated Lights-Out Value Packs, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html

Optimize

HP Insight Power Manager (IPM)

HP Insight Power Manager, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates — 452677-B21
NOTE: Customers purchasing this upgrade must already have an iLO Advanced or Select license on each managed server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

Options

	NOTE: For additional HP Insight Power Manager Packs, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12623_na/12623_na.html	
	ProLiant Essentials Virtual Machine Management Pack	
	ProLiant Essentials Virtual Machine Management Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates NOTE: Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. NOTE: For additional ProLiant Virtual Machine Management Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_na/12328_na.html NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information. NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: http://www.hp.com/servers/proliantessentials.	452153-B21
Processor	Quad-Core Intel® Xeon® Processor E7340 (2.40 GHz, 2x4 MB, 80W, 2P)	443691-B21
	Quad-Core Intel® Xeon® Processor E7330 (2.40 GHz, 2x3 MB, 80W, 2P)	449321-B21
	Quad-Core Intel® Xeon® Processor E7320 (2.13 GHz, 2x2 MB, 80W, 2P)	443692-B21
	Quad-Core Intel® Xeon® Processor E7310 (1.60 GHz, 2x2 MB, 80W, 2P)	443693-B21
	Quad-Core Intel® Xeon® Processor L7345 (1.86 GHz, 2x4 MB, 50W, 2P)	450963-B21
	Dual-Core Intel® Xeon® Processor E7220 (2.93 GHz, 2x4 MB, 80W, 2P)	450961-B21
Memory	2 GB FBD PC2-5300 2x1 GB Kit	397411-B21
	4 GB FBD PC2-5300 2x2 GB Kit	397413-B21
	8 GB FBD PC2-5300 2x4 GB Kit	397415-B21
	8 GB FBD PC2-5300 2 x 4 GB LP Kit, Low Power	466440-B21
	16 GB FBD PC2-5300 2x8 GB Kit	413015-B21
	HP 2 GB FBD PC2-5300 2x1 GB Low Power Kit	461826-B21
	HP 4 GB FBD PC2-5300 2x2 GB Low Power Kit	461828-B21

Options

Hard Drives	Serial Attached SCSI (SAS) SFF Hot Plug	
	HP 72 GB 3G SAS 15k SFF DP HDD	418371-B21
	HP 72 GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 36 GB 3G SAS 15k SFF DP HDD	418369-B21
	HP 36 GB 3G SAS 15K SFF SP HDD	431933-B21
	HP 146 GB 3G SAS 10K SFF DP HDD	418367-B21
	HP 146 GB 3G SAS 10K SFF HDD	431958-B21
	HP 72 GB 3G SAS 10K SFF DP HDD	384842-B21
	HP 72 GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 36 GB 3G SAS 10K SFF SP HDD	375859-B21
	NOTE: SAS drives have a 3 year warranty.	
	NOTE: Please see the SAS Hard Drive QuickSpecs for technical specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
	SFF SATA Hot Plug	
	HP 120 GB 1.5G SATA 5.4K SFF HDD	431786-B21
	HP 60 GB 1.5G SATA 5.4K SFF HDD	379306-B21
	NOTE: SATA drives have a 1 year warranty. Please see the SATA Hard Drive QuickSpecs for technical specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: http://h18000.www1.hp.com/products/quickspecs/11940_na/11940_na.html	
Storage Controllers	P400i Battery-backed write cache upgrade	383280-B21
	P400i 512 MB and battery-backed write cache upgrade	405148-B21
Cluster Options	NOTE: For configuration/certification options for the HP Parallel Database Cluster for Oracle RAC please go to: http://www.hp.com/solutions/highavailability/oracle	
	NOTE: For additional information regarding the HP ProLiant Cluster for HA/F500 please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10232_na/10232_na.html	
	ProLiant Cluster Starter Kit	364023-B22
	NOTE: For additional information regarding the ProLiant Cluster Starter Kit please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11935_na/11935_na.html	
	HP Serviceguard for Linux ProLiant Cluster, A.11.18 (single license version - Red Hat EL 4&5, SUSE SLES10)	307754-B27
	HP Serviceguard for Linux, A.11.18 (2 license version - Red Hat EL 4&5, SUSE SLES10)	305199-B27
	HP Serviceguard for Linux and Red Hat Global File System - 1 year subscription	T2798AA#001
	HP Serviceguard for Linux and Red Hat Global File System - 3 years subscription	T2798AA#003
	NOTE: For additional information regarding the HP Serviceguard for Linux License, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html	

Options

USB Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP 1 GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256 MB USB 2.0 Floppy Drive Key	442084-B21
	External USB 2.0 Multi-Bay II Cradle	PA509A
	Multibay II 9.5mm DVD Drive	PA849A
	USB 2.0 4-port Hub	DG954A
	HP USB 04 Standard Keyboard	DT528A#ABA
Service and Support Offerings (HP Care Pack Services)	NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	Hardware Services On-site Service	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE458E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE459E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE460E
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	UE473E

Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

DIMM installation guidelines:

1. All DIMMs must be PC2-5300 Fully Buffered DIMMs running at 667 MHz.
2. Both DIMM slots in a memory bank must be populated.
3. Banks must be populated in sequential alphabetic order, starting with bank A.
4. Both DIMMs in a memory bank must be identical. Install identical DIMMs as pairs only, starting with DIMM socket 1, bank A.
5. Standard memory and lower power DIMMs may be mixed within the same server, but not within the same memory bank (see #4 above).
6. Low power DIMM kits save approximately 2 watts per server DIMM, plus any datacenter power savings resulting from reduced cooling of heat dissipated from the lower server watt usage.
7. Multiple advanced memory protection (AMP) modes are supported based on FB DIMM population and RBSU selection. The server blade defaults to Advanced ECC.

HP ProLiant BL680c Server G5 (1P Model)

Standard Memory

8 GB (2x4 GB) of PC2-5300, FBD DDR2-667 ECC DIMMs

Standard Memory Plus Optional Memory

Up to 104 GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 128 GB of PC2-5300, FBD DDR2-667 DIMM memory is available with the removal of standard memory and the installation of optional PC2-5300, FBD DDR2-667 DIMM memory expansion kits.

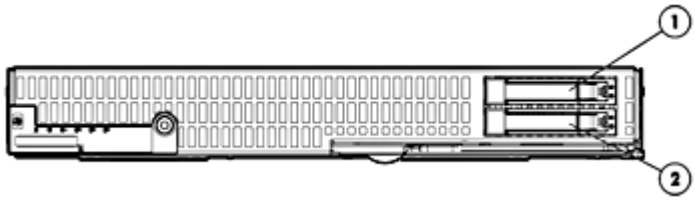
Memory		Slot							
Standard	8 GB	1A	2C	3E	4G	5A	6C	7E	8G
		2 GB	Empty	Empty	Empty	2 GB	Empty	Empty	Empty
		9B	10D	11F	12H	13B	14D	15F	16H
		2 GB	Empty	Empty	Empty	2 GB	Empty	Empty	Empty
Optional	104 GB	1A	2C	3E	4G	5A	6C	7E	8G
		2 GB	8 GB	8 GB	8 GB	2 GB	8 GB	8 GB	8 GB
		9B	10D	11F	12H	13B	14D	15F	16H
		2 GB	8 GB	8 GB	8 GB	2 GB	8 GB	8 GB	8 GB
Maximum	128 GB	1A	2C	3E	4G	5A	6C	7E	8G
		8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
		9B	10D	11F	12H	13B	14D	15F	16H
		8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB

HP ProLiant BL680c G5 memory options:

Following are memory options available from HP:

2 GB FBD PC2-5300 2 X 1 GB Kit	397411-B21
4 GB FBD PC2-5300 2 x 2 GB Kit	397413-B21
8 GB FBD PC2-5300 2 x 4 GB Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB LP Kit, Low Power	466440-B21
16 GB FBD PC2-5300 2x8 GB Kit	413015-B21
HP 2 GB FBD PC2-5300 2x1 GB Low Power Kit	461826-B21
HP 4 GB FBD PC2-5300 2x2 GB Low Power Kit	461828-B21

Storage



1-2 2 x SFF SAS or SATA hot-plug hard drives

Hard Drives

SAS Hard Drive

	Quantity Supported	Position Supported	Controller
72 GB 15,000 rpm SFF SAS 36 GB 15,000 rpm SFF SAS 146 GB 10,000 rpm SFF SAS 72 GB 10,000 rpm SFF SAS 36 GB 10,000 rpm SFF SAS	2	1-2	Smart Array P400i Controller

Serial-ATA (SATA) Hard Drive

	Quantity Supported	Position Supported	Controller
120 GB 5,400 rpm SFF SATA 60 GB 5,400 rpm SFF SATA	2	1-2	Smart Array P400i Controller

System Unit	Dimensions (H x W x D)	Full height server blade: 14.42 x 2.03 x 20.06 in (36.17 x 5.16 x 50.95 cm)	
	Weight (approximate)	Maximum (all hard drives and processors installed)	21 lb (9.5 kg)
		Minimum (one hard drive and processor installed)	19 lb (8.6 kg)
	Power Specifications	For power specifications including input requirements, BTU rating, and power supply output, please see the HP BladeSystem c-Class Infrastructure QuickSpecs located at: http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.html To review typical system power ratings use the HP BladeSystem Power Sizer available at: http://www.hp.com/go/bladesystem/powercalculator.	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-Operating	-30° to 60°C (-22° to 140°F), maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 85% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-Operating	10 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	For acoustic noise specifications, please see the HP BladeSystem c-Class Infrastructure QuickSpecs located at: http://h18000.www1.hp.com/products/quickspecs/12517_na/12517_na.html	

Technical Specifications

Smart Array P400i Controller	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x8 2.5G PCIe provides 2 GB/s maximum bandwidth.
	SAS Speed	x8 3G SAS provides 2.4 GB/s maximum bandwidth.
	Cache Memory	40-bit 256 MB cache (72-bit 512MB module upgrades available); ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	584 GB (4 x 146 GB) SAS 480 GB (4 x 120 GB) SATA
	Host Memory Addressing	64-bit, supporting greater than 4 GB server memory space
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware with recovery ROM feature

Embedded NC326i Dual Port Gigabit Server Adapter	Network Processor	Broadcom 5715S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	Two ports, each at 1000 Mb/s (Theoretical Maximum Values)
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	• 9K Jumbo frames • TCP/IP checksum offload (TCO) • Large send offload (LSO) • Interrupt coalescence • Dual address cycles (DAC) • Wake-on-LAN (WOL) • Pre-boot execution environment (PXE) • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Windows

Technical Specifications

Embedded NC373i Multifunction Gigabit Server Adapters	Network Processor	Broadcom 5708S
	Data Transfer Method	Four lane (x4) PCI Express
	Network Transfer Rate	1000 Mb/s (theoretical maximum values)
	IEEE Compliance	802.1p, 802.1Q, 802.3, 802.3ad, and 802.3x
	Standard Features	• TCP/IP offload engine (TOE) for Microsoft Windows 2003 • iSCSI boot for Linux • 9K Jumbo frames • TCP/IP checksum offload (TCO) • Large send offload (LSO) • Interrupt coalescence • Dual address cycles (DAC) • Wake-on-LAN (WOL) • Pre-boot execution environment (PXE) • ProLiant Teaming including Network Fault Tolerance, Transmit Load Balancing, and Switch-Assisted Load Balancing • IPv6 packet transmit and receive (excluding all offload capabilities); IPv6 aware SNMPv1 agents for Windows

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.